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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/693,231	**Applicant(s)** KAKE ET AL.	
	Examiner Said Broome	**Art Unit** 2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 May 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,17,22 and 24-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-3* is/are allowed.

6)☒ Claim(s) *4-12,17,22,24-28 and 31-41* is/are rejected.

7)☒ Claim(s) *13,29 and 30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This office action is in response to an amendment filed on 5/7/2010.
2. Claims 22, 24 and 41 have been amended by the applicant.
3. Claims 1-14 and 25-40 are original.
4. Claims 15-21, 23 and 42 have been cancelled.

Allowable Subject Matter

In regards to claim 13, Seki and Fels fail to teach that the image conversion unit partially changes a rate of the new moving-picture frame to be outputted from said image data output unit in a manner such that, according to attribute values of image regions that constitute the two-dimensional images, the cut surface is varied in time with different speed for each of the image regions. Therefore claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In regards to claims 29 and 30, Seki and Fels fail to teach that the attribute value is a value that indicates the order of approximation relative to a desired image pattern, therefore claims 29 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 1-3 are allowed. The following is an examiner's statement of reasons for allowance:

In regards to claim 1, the prior art fails to teach projecting a first image that appears on the cut surface onto a first plane perpendicular to the time axis, varying the cut surface in time, projecting a second image that appears on the varied cut surface onto a second plane perpendicular to the time axis, and outputting the first and second images appearing on the first and second planes as new moving pictures, therefore claims 1-3 are allowable.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 40 and 41 are rejected under 35 U.S.C. 101 because claims 40 and 41 recite: "*A computer readable medium…*", however, the ordinary meaning of a computer readable medium known in the art covers forms of non-transitory mediums(CD-ROM, hard drives, etc.) and transitory mediums (propagating signals, etc.), therefore claims 40 and 41 are not statutory for reciting a computer readable medium which covers both non-statutory subject matter and statutory subject matter. However, claims 40 and 41 may be amended to narrow the claim to cover only statutory embodiments by amending the claim to recite "*A non-transitory computer readable medium…*". Claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena. O'Reilly*,* 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in § 101. First, a claimed signal is clearly not a "process" under § 101 because it is not a series of

steps. The other three § 101 classes of machine, compositions of matter and manufactures "relate to structural entities and can be grouped as 'product' claims in order to contrast them with process claims." 1 D. Chisum, Patents § 1.02 (1994). The three product classes have traditionally required physical structure or material.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4-9, 14, 17, 22, 24-28 and 31-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki (JP 09-035040) in view of Yamamoto et al. (hereinafter "Yamamoto", US Patent 6,556,210).

Regarding claim 4, Seki teaches sequentially storing original moving pictures along a time axis and, regarding the original moving pictures as two-dimensional images that vary along time axis, and, when the moving pictures are expressed, in a virtual manner, as a box space formed by the two-dimensional images and the time axis, cuts the box space by a surface that contains a plurality of points each of which differs from the other in time value, and which projects an image that appears on the cut surface onto a plane perpendicular to the time axis (paragraph 0011 lines 5-9: "*…suppose there is a time axis (T-axis) perpendicular to both X-axis and Y-axis, by setting the images along this axis, it is possible to construct the three-dimensional image shown in Figure 3, that is, time-space image I(x, y; t). In step SP2, said time-space image*

I(x, y; t) is cut by a plane parallel to the time axis, and the image appearing on the cut plane is taken as cross-sectional image…", *therefore the invention of Seki contain an image conversion unit to implement projection of the image onto a plane perpendicular to the time axis*), and an image data output unit (Fig. 4, *in which output data images are displayed, therefore the invention of Seki thereby contains a display, or image data pout unit, utilized to render the image of Fig. 4*) which sets a new moving-picture frame the images appearing on the plane obtained by varying the cut surface in time (paragraph 0006 lines 6-9: "*…all of the consecutive images over a prescribed time are set side-by-side in time to form a three-dimensional time-space image; the time-space image formed in the aforementioned operation is cut by plural planes perpendicular to the original consecutive images…*"). However, Seki fails to teach an image generating apparatus and image memory. Yamamoto teaches an image generating apparatus (Fig. 5) and image memory (Fig. 5: 103). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the plurality of images provided by Seki with the apparatus of Yamamoto because this modification would ensure the portability of images appearing on a cut surface along a time axis through storage on an image memory readable by a plurality of computer devices known in the art.

Regarding claim 5, Seki teaches an image conversion unit or image processor, that realizes varying the cut surface in time by moving the surface along the time axis (paragraph 0012 lines 8-11: "*…an image obtained by cutting said time-space image I(x, y; t) with a helix plane along the movement direction of the object. This plane completely contains the information pertaining to the movement of the object, that is, movement velocity and movement direction.*").

Regarding claim 6, Seki illustrates the surface defined in a manner such that the surface has continuous or discrete width the direction of the time axis (Figure 4). Seki teaches the image conversion, or processor, synthesizes images covered within the width (paragraph 0012 lines 1-2 and 8-11: "*On said cross-sectional image C(d, t; θ), a portion of the image of moving object (21) contained in the original consecutive images must appear as the trace…this trace cross-sectional image L(s, θ; t) is an image obtained by cutting said time-space image I(x, y; t) with a helix plane along the movement direction of the object. This plane completely contains the information pertaining to the movement of the object…*"), where the trace image contains a synthesized image containing information from all the images along the time axis.

Regarding claim 7, Seki teaches an image conversion unit, or image processor, cuts the box space by a surface defined by a function of coordinates of an image region constituting the two-dimensional image (paragraph 0011 lines 5-7: "*…there is a time axis (T-axis) perpendicular to both X-axis and Y-axis, by setting the images along this axis, it is possible to construct the three-dimensional image shown in Figure 3, that is, time-space image I(x, y; t).*").

Regarding claim 8, Seki teaches the surface is defined by a function which does not depend on a horizontal coordinate of the two-dimensional image (paragraph 0011 lines 5-9: "*…suppose there is a time axis (T-axis) perpendicular to both X-axis and Y-axis, by setting the images along this axis, it is possible to construct the three-dimensional image shown in Figure 3, that is, time-space image I(x, y; t). In step SP2, said time-space image I(x, y; t) is cut by a plane parallel to the time axis…*"), where the cut surface is defined along the time axis, therefore the surface is defined along the t coordinate.

Regarding claim 9, Seki teaches the image conversion unit, or image processor, cuts the box space by a surface which is defined by a function of attribute values for an image region constituting the two-dimensional image (paragraph 0012 lines 1-2 and 6-11: "*...a portion of the image of moving object (21) contained in the original consecutive images must appear as the trace…This is called trace cross-sectional image L(s, θ; t), and it is found that this image becomes a place containing the velocity vector of the moving object…This plane completely contains the information pertaining to the movement of the object…*"), where it the surface is defined by an attribute that represents the velocity of the movement of the object along the time axis.

Regarding claim 14, Seki teaches that a time value that defines the surface includes at least one of a past or a future with the present time being a center thereof (paragraph 0006 lines 6-8: "*…all of the consecutive images over a prescribed time are set side-by-side in time to form a three-dimensional time-space image; the time-space image formed in the aforementioned operation is cut by plural planes perpendicular to the original consecutive images…*"), where the surface is parallel to the time axis, therefore at any present time value the values analyzed from the left and to the right of that value are the past and future time values.

Regarding claim 17, Seki teaches reading out, for each in-picture position of an image contained in a target frame in original moving pictures, data that correspond to the in-picture position, from at least one of a plurality of frames contained in the original moving pictures (paragraph 0012 lines 1-2 and 6-11: "*...a portion of the image of moving object (21) contained in the original consecutive images must appear as the trace…This is called trace cross-sectional image L(s, θ; t), and it is found that this image becomes a place containing the velocity vector of*

the moving object…This plane completely contains the information pertaining to the movement of the object…"), where a certain region from all the frames is captured (Figure 4). Seki also teaches synthesizing the read-out data in a ratio according to an attribute value of the image contained in at least one of the plurality of frames (paragraph 0012 lines 1-2 and 8-11: "*On said cross-sectional image C(d, t; θ), a portion of the image of moving object (21) contained in the original consecutive images must appear as the trace…this trace cross-sectional image L(s, θ; t) is an image obtained by cutting said time-space image I(x, y; t) with a helix plane along the movement direction of the object. This plane completely contains the information pertaining to the movement of the object…*"), where an attribute value, such as the proportional difference in the position of the object over time, is tracked and presented in a synthesized image that displays the movement of the object over a time interval (Figure 5). Though Seki does not specifically teach forming new moving images by sequentially outputting frames formed in the synthesizing, it would have been obvious to one of ordinary skill in the art at the time of invention to enable the output of several synthesized images because the output of several synthesized images would enable a user to animate the movement of several objects in a sequence of images through generation of several synthesized images for each group that corresponds to an object in sequence of images (paragraph 0015 lines 1-5: "*When there are plural moving objects in the cross-sectional images, plural groups of the cross-sectional images are prepared corresponding to the respective objects, to get the trace cross-sectional image for each object.*"), whereby a special effect may then be visualized showing the movement of several objects present in the sequence of images. Seki also teaches an image generating method (Figure 1), as recited in the preamble.

Regarding claims 22 and 24, Seki teaches an image generating apparatus which includes an image memory, an image conversion unit and an image data output unit (¶0011 lines 1-3: "*…a camcorder is used to take the consecutive images that are input to an image processor…as shown in Figure 1, as the images…are represented…*", *in which an image pickup apparatus enables captured images, thereby stored on memory within the apparatus, to enable image display conversion processing enabling the images to be output, as recited in claims 22 and 24*), and a computer readable medium encoded with a computer program (¶0011 lines 1-3: "*…a camcorder is used to take the consecutive images that are input to an image processor…as shown in Figure 1, as the images…are represented…*", *Fig. 4, stores a program to execute the image generation, Fig. 4, as recited in the preamble of claim 41*),

wherein said image memory (¶0011 lines 1-2: "*As shown in Fig. 1, for example, a camcorder is used to take the consecutive images that are input to an image processor.*", *in which the images are collected by an image pickup device and are thereby stored in an image memory, as disclosed in claims 22 and 24*), records, in sequence, original moving pictures for each frame, wherein said image conversion unit determines, for each in-picture position of an image contained in a target frame (¶0012 lines 1-2 and 8-11: "*On said cross-sectional image C(d, t; θ), a portion of the image of moving object (21) contained in the original consecutive images must appear as the trace…this trace cross-sectional image L(s, θ; t) is an image obtained by cutting said time-space image I(x, y; t) with a helix plane along the movement direction of the object. This plane completely contains the information pertaining to the movement of the object…*", *wherein for the successive frames, the position of an object in image is tracked, Fig. 4*),

regards the original moving pictures as two-dimensional images that vary along time axis, and, when the moving pictures are expressed, in a virtual manner, as a box space formed by the two-dimensional images and the time axis, cuts the box space by a surface that contains a plurality of points each of which differs from the other in time value, and which projects an image that appears on the cut surface onto a plane perpendicular to the time axis (paragraph 0011 lines 5-9: "*…suppose there is a time axis (T-axis) perpendicular to both X-axis and Y-axis, by setting the images along this axis, it is possible to construct the three-dimensional image shown in Figure 3, that is, time-space image I(x, y; t). In step SP2, said time-space image I(x, y; t) is cut by a plane parallel to the time axis, and the image appearing on the cut plane is taken as cross-sectional image…*", *therefore the invention of Seki contain an image conversion unit to implement projection of the image onto a plane perpendicular to the time axis*), such that:

a plurality of frames at predetermined time intervals from the frames recorded in said image memory (¶0013 lines 1-2: "*…all of the consecutive images within a prescribed time are obtained beforehand.*", *where fames are captured over a predetermined time interval, that enables the time intervals between the frames to be predetermined, Fig. 2*),

wherein said image conversion unit reads out, from the plurality of frames, data that correspond to the in-picture position and synthesizes the data according to an attribute value (¶0012 lines 1-2 and 6-11: "*...a portion of the image of moving object (21) contained in the original consecutive images must appear as the trace…This is called trace cross-sectional image L(s, θ; t), and it is found that this image becomes a place containing the velocity vector of the moving object…This plane completely contains the information pertaining to the movement of the object…*", *where a certain region from all the frames is captured, as shown in Fig. 4, where*

an attribute value, such as the proportional difference in the position of the object over time, is tracked and presented in a synthesized image that displays the movement of the object over a time interval, Fig. 5), and

wherein said image data outputs, as new moving pictures, the image that appear on the perpendicular surface by varying the cut surface in time (Fig. 4), such that:

wherein said image data output unit sequentially outputs the target frame reconstructed by synthesis along a time axis (¶0015 lines 1-5: "*When there are plural moving objects in the cross-sectional images, plural groups of the cross-sectional images are prepared corresponding to the respective objects, to get the trace cross-sectional image for each object.*" and ¶0012 lines 1-2 and 8-11: "*On said cross-sectional image C(d, t; θ), a portion of the image of moving object (21) contained in the original consecutive images must appear as…an image obtained by cutting said time-space image I(x, y; t)…This plane completely contains the information pertaining to the movement of the object…" and is illustrated in Fig. 3: axis T, in which output of several synthesized images is provided to enable a user to animate the movement of several objects in a sequence of images across the time axis T through generation of several synthesized images for each group that corresponds to an object in sequence of images*, *whereby a special effect may then be visualized showing the movement of several objects present in the sequence of images*).

However, Seki fails to teach synthesizing data at an alpha value, an image generating apparatus and image memory. Yamamoto teaches synthesizing data at an alpha value (col. 17 lines 14-16: "*…the first image 201 and generated second image 202 are synthesized using the value α to produce a third image…*"), an image generating apparatus (Fig. 5) and image memory (Fig. 5: 103). Therefore it would have been obvious to one of ordinary skill in the art at the time

of invention to modify the plurality of images provided by Seki with the alpha value synthesis of Yamamoto because this modification would ensure acute synthesized images are du through utilizing the alpha value in each of the images during synthesis thereby reducing visual discontinues or errors through correctly merging the images in response to a common alpha value to preserve the integrity of the image after synthesis.

Regarding claim 25, Seki describes that the target frame or at least one of frames is at least one of a previous frame in time or a subsequent frame in time with respect to a reference frame which should have been naturally outputted by said image data output unit from said image memory (¶0006 lines 6-7: "*…all of the consecutive images over a prescribed time are set side-by-side in time to form a three-dimensional time-space image…*", *where the frames are successively located along a time axis, enabling a particular frame that is presently analyzed to have a frame from the past in reference to a current frame*).

Regarding claim 26, Seki describes that for each in-picture position of the images contained in the target frame, the image conversion unit or processor adds a predetermined pixel value in accordance with an attribute value thereof (¶0016 lines 3-7: "*…cutting of the initial time-space image is performed in all directions…the cutting plane is made of a helix plane along the movement trace of the object, and this plane completely contains the movement vector of the object, and it contains all of the information about the movement trace.*", *where a predetermined cut is performed on the surface containing a position, or pixel value, within the frames to track the movement of the object in accordance with an attribute value, such as the specified time interval of the frames*, ¶0011 lines 1-5: "*…a camcorder is used to take the consecutive images…as the images at an instant (11, 12, 13) shown in Fig. 2 are represented as I(x, y) with*

the orthogonal coordinates of X-axis and Y-axis, all of the images obtained are set side-by-side in time sequence.").

Regarding claim 27, Seki teaches an attribute or depth value, t, (paragraph 0011 lines 5-7: "*…there is a time axis (T-axis) perpendicular to both X-axis and Y-axis, by setting the images along this axis, it is possible to construct the three-dimensional image shown in Figure 3, that is, time-space image I(x, y; t).*", Figure 3).

Regarding claim 28, Seki teaches an attribute value is a depth value (¶0011 lines 5-7: "*…there is a time axis (T-axis) perpendicular to both X-axis and Y-axis, by setting the images along this axis, it is possible to construct the three-dimensional image shown in Fig. 3, that is, time-space image I(x, y; t).*", Fig. 3).

Regarding claims 31 and 32, Seki teaches an attribute value or movement vector value that indicates a degree of change of an image area in time (paragraph 0016 lines 3-7: "*…cutting of the initial time-space image is performed in all directions…the cutting plane is made of a helix plane along the movement trace of the object, and this plane completely contains the movement vector of the object, and it contains all of the information about the movement trace.*").

Regarding claim 33, Seki teaches an attribute value that is a pixel value (paragraph 0012 lines 1-2: "*…a portion of the image of moving object (21) contained in the original consecutive images must appear as the trace…only the portion containing angle θ_d is extracted from each cross-sectional image $C(d, t; \theta)$, and a new image is formed.*"), where the position of the pixel with the image frame is tracked over a time interval.

Regarding claim 34, Seki describes the attribute value is a pixel value (¶0012 lines 1-2: "*…a portion of the image of moving object (21) contained in the original consecutive images must appear as the trace…only the portion containing angle θ_d is extracted from each cross-sectional image C(d, t; θ), and a new image is formed.*", *where the position of the pixel with the image frame is tracked over a time interval*).

Regarding claim 35, Though Seki does not explicitly teach an image memory, it would have been obvious to one of ordinary skill in the art that an image pickup device, such as a camera or camcorder (paragraph 0011 lines 1-2: "*…a camcorder is used to take the consecutive images that are input to an image processor.*"), contains an image memory for capturing images.

Regarding claim 36, Seki describes acquiring, as moving pictures, images shot by a camera and sending image to image memory (¶0011 lines 1-2: "*…a camcorder is used to take the consecutive images that are input to an image processor.*", *where the teachings of Seki provide an image input unit which acquires, as the original moving pictures, image shot by a camera and sends the images to a camcorder, thereby containing an internal image memory*).

Claims 10-12 and 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki in view of Fels et al.(hereinafter "Fels", "*Techniques for Interactive Video Cubism*").

Regarding claim 10, Seki fails to teach the limitations. Though Fels does not explicitly teach a setting input unit and image conversion unit, it would have been obvious to one of ordinary skill in the art at the time of invention that the input capabilities provided to the user have a corresponding input unit, as well as an image conversion unit to process the images displayed (Figures 1-4). Fels teaches input acquired via a user operation, used to define the

surface, where the image conversion unit cuts the box space by the surface defined by a function of the setting value acquired by the setting input unit (section 3.3.1 lines 1-2: "*The cut plane allows the user to move a planar window inside the video cube and examine the corresponding imagery…*"), where the three-dimensional surface is cut by a plane (Fig. 3), therefore it is obvious that the processed images displayed (Figs. 1-4) were obtained using an image conversion unit. Therefore it would have been obvious to one of ordinary skill in the art to combine the moving images of Seki with the virtual cube Fels because this combination would provide the ability to accurately display successive frames of animation or video collectively in a three-dimensional format in which the user may interactive with the data to define a plane by which to cut the surface of the data to define a representation of the change of the images or frames over a time interval thereby enabling temporal analysis of the data.

Regarding claim 11, Seki teaches a curve that indicates a relation between coordinates of points contained in the two-dimensional images and time values thereof and a variable of the function is displayed on a screen (paragraph 0012 lines 1-11: "*On said cross-sectional image C(d, t; θ), a portion of the image of moving object (21) contained in the original consecutive images must appear as the trace…the object trace on said cross-sectional image C(d, t; θ) at a certain time is determined…This is called trace cross-sectional image L(s, θ; t), and it is found that this image becomes a place containing the velocity vector of the moving object…this trace cross-sectional image L(s, θ; t) is an image obtained by cutting said time-space image I(x, y; t) with a helix plane along the movement direction of the object.*", Fig. 5). However, Seki fails to teach a setting input unit and a setting value. Though Fels does not explicitly teach a setting input unit, it would have been obvious to one of ordinary skill in the art at the time of invention

that the input capabilities provided to the user have a corresponding input unit, therefore the input (section 3.3.1 lines 1-2) has a corresponding input unit to provide a value that is used to define the cut surface (Fig. 4). Therefore it would have been obvious to one of ordinary skill in the art to combine the moving images of Seki with the virtual cube Fels because this combination would provide the ability to accurately display successive frames of animation or video collectively in a three-dimensional format in which the user may interactive with the data to define a plane by which to cut the surface of the data to define a representation of the change of the images or frames over a time interval thereby enabling temporal analysis of the data.

Regarding claim 12, Seki teaches that based on coordinates of characteristic points in the two-dimensional images, the image conversion unit, or image processor, cuts the box space by a curve defined by a function of the coordinates of the characteristics points (paragraph 0012 lines 1-11: "*This is called trace cross-sectional image L(s, θ; t), and it is found that this image becomes a place containing the velocity vector of the moving object. That is, this trace cross-sectional image L(s, θ; t) is an image obtained by cutting said time-space image I(x, y; t) with a helix plane along the movement direction of the object* ", Figure 5). However, Seki fails to teach a setting input unit and a setting value. Though Fels does not explicitly teach a setting input unit, it would have been obvious to one of ordinary skill in the art at the time of invention that the input capabilities provided to the user have a corresponding input unit, therefore the input (section 3.3.1 lines 1-2) has a corresponding input unit to provide a value that is used to define a certain portion of the cut surface (Fig. 4). Therefore it would have been obvious to one of ordinary skill in the art to combine the moving images of Seki with the virtual cube Fels because this combination would provide the ability to accurately display successive frames of

animation or video collectively in a three-dimensional format in which the user may interactive with the data to define a plane by which to cut the surface of the data to define a representation of the change of the images or frames over a time interval thereby enabling temporal analysis of the data.

Regarding claim 37, Seki and Yamamoto fail to teach a setting input unit which acquires, via a user operation, input of a setting value used to determine the at least one of frames, wherein said image conversion unit determines the at least one of frames according to the setting value acquired by said setting input unit. Fels teaches a setting input unit and image conversion unit (sec. 1 1st ¶ lines 1-3: "*Using the mouse as a virtual trackball, the user is able to rotate or translate the entire scene, the video cube, or the cut plane.*", *where a plane which corresponds with an associated frame, as shown in Fig. 1, may be selected by user input, thereby enabling one skilled in the art to understand that the input capabilities provided to the user has a functionally equivalent setting input unit, as well as an image conversion unit to process the displayed images, which acquires, via user operation, input of a setting value used to determine the at least one of frames, as disclosed in* sec. 1 1st ¶ lines 1-3: "*Using the mouse as a virtual trackball, the user is able to rotate or translate the entire scene, the video cube, or the cut plane.*"), where the image conversion unit cuts the box space by the surface defined by a function of the setting value acquired by the setting input unit (sec. 3.3.1 lines 1-2: "*The cut plane allows the user to move a planar window inside the video cube and examine the corresponding imagery…*", *where the three-dimensional surface is cut by a plane, Fig. 3, in which the teachings of Seki provide processed images that are therefore displayed and obtained using a functionally equivalent image conversion*), therefore it would have been obvious to one of

ordinary skill in the art to modify the captured frames generated by Seki and alpha value synthesis of Yamamoto with the interactive frame interaction provided by Fels because this modification would provide the ability to accurately display successive frames of animation or video collectively in a three-dimensional format in which the user may interactive with the data to define a plane by which to cut the surface of the data to define a synthesized representation of the change of the images or frames over a time interval with respect to an alpha value thereby enabling temporal analysis of the data.

Regarding claim 38, Seki describes a curve that indicates a relation between coordinates of points contained in the two-dimensional images and time values thereof and a variable of the function is displayed on a screen (¶0012 lines 1-11: "*On said cross-sectional image C(d, t; θ), a portion of the image of moving object (21) contained in the original consecutive images must appear as the trace…the object trace on said cross-sectional image C(d, t; θ) at a certain time is determined…This is called trace cross-sectional image L(s, θ; t), and it is found that this image becomes a place containing the velocity vector of the moving object…this trace cross-sectional image L(s, θ; t) is an image obtained by cutting said time-space image I(x, y; t) with a helix plane along the movement direction of the object.*", Fig. 5). However, Seki and Yamamoto fail to teach a setting input unit and a setting value. Fels teaches that the input capabilities provided to the user have a corresponding input unit, therefore the provided input (sec. 1 1st ¶ lines 1-3: "*Using the mouse as a virtual trackball, the user is able to…translate…the video cube, or the cut plane.*" and sec. 3.3.1 lines 1-2: "*The cut plane allows the user to move a planar window inside the video cube and examine the corresponding imagery…*", *in which the teachings of Seki thereby provide functionally equivalent setting of input to provide a value defining the cut*

surface, Fig. 4), therefore it would have been obvious to one of ordinary skill in the art to modify the captured frames generated by Seki and alpha value synthesis of Yamamoto with the interactive frame interaction provided by Fels because this modification would provide the ability to accurately display successive frames of animation or video collectively in a three-dimensional format in which the user may interactive with the data to define a plane by which to cut the surface of the data to define a synthesized representation of the change of the images or frames over a time interval with respect to an alpha value thereby enabling temporal analysis of the data.

Regarding claim 39, Seki describes that based on coordinates of characteristic points in the two-dimensional images, the image conversion unit, or image processor, cuts the box space by a curve defined by a function of the coordinates of the characteristics points (¶0012 lines 1-11: "*This is called trace cross-sectional image $L(s, \theta; t)$, and it is found that this image becomes a place containing the velocity vector of the moving object. That is, this trace cross-sectional image $L(s, \theta; t)$ is an image obtained by cutting said time-space image $I(x, y; t)$ with a helix plane along the movement direction of the object* ", *Fig. 5*). However, Seki and Yamamoto fail to teach a setting input unit and a setting value. Fels teaches that the input capabilities provided to the user have a corresponding input unit, therefore the input (sec. 1 1st ¶ lines 1-3: "*Using the mouse as a virtual trackball, the user is able to…translate…the video cube, or the cut plane.*" and sec. 3.3.1 lines 1-2: "*The cut plane allows the user to move a planar window inside the video cube and examine the corresponding imagery…*", *in which the teachings of Seki thereby provide functionally equivalent setting of input to provide a value defining a certain portion of the cut surface, Fig. 4*), therefore it would have been obvious to one of ordinary skill in the art to modify

the captured frames generated by Seki and alpha value synthesis of Yamamoto with the interactive frame interaction provided by Fels because this modification would provide the ability to accurately display successive frames of animation or video collectively in a three-dimensional format in which the user may interactive with the data to define a plane by which to cut the surface of the data to define a synthesized representation of the change of the images or frames over a time interval with respect to an alpha value thereby enabling temporal analysis of the data.

Response to Arguments

Applicant's arguments with respect to claims 4-12, 14, 17, 22, 24-28 and 31-41 have been considered but are moot in view of the new ground(s) of rejection. Claims 1-3 have been indicated as allowable, as disclosed in the above office action. Claims 13, 29 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The 35 U.S.C. 112, second paragraph rejection of claims 22 and 24 has been withdrawn due to the amendment to claims 22 and 24 to recite "*the target frame*".

To expedite prosecution, the Examiner would like to suggest amendments to independent claims 22, 24 and 41 to recite the allowable subject matter of claim 1 : "…*projecting a first image that appears on the cut surface onto a first plane perpendicular to the time axis, varying the cut surface in time, projecting a second image that appears on the varied cut surface onto a second plane perpendicular to the time axis, and outputting the first and second images appearing on the first and second planes as new moving pictures.*".

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Said Broome whose telephone number is (571)272-2931. The examiner can normally be reached on M-F 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on (571)272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Said Broome/
Primary Examiner, Art Unit 2628